

# The box tree moth, *Cydalima perspectalis* Walker 1859: a real threat in Catalonia

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## INTRODUCTION

The box tree moth, *Cydalima perspectalis*, is a lepidopteron natural from the East of Asia. This insect lives and feeds on the leaves of different species of *Buxus* genera, causing a severe defoliation in ornamental and wild plants. In recent years, *C. perspectalis* has become an invasive specie in Europe. The first detection in Catalonia was on July 2014 in Besalú (La Garrotxa) and his distribution is expected to increase considerably in this area.

## OBJECTIVES

- Evaluate the current situation of *C. perspectalis* in Catalonia.
- Determine the possible damage in this territory.
- Develop an integrated pest management to control invasion.
- Design an informative sheet of *C. Perspectalis* to inform population.



## DESCRIPTION AND CYCLE

Larvae are green with wide black and thin white lines along the length of his back, while tubercles are black outlined in white (Fig. 1 and 8). The head is black throughout all stages. The rang of stages are 3-7 and the average length for mature larvae is 3.8 cm. *C. perspectalis* overwinters as larva in a cocoon spun, normaly in the third stage.

The metamorphosis process takes 2-4 weeks. Pupae are green during the first few days while older pupae become brown (Fig. 2 and 3). Average length of adults wingspan is 3.8 cm. There are 2 varieties: the most common is iridescent white with a wide brown border around the edges (Fig. 4 and 9) and the second one is completely brown. Both varieties shown a distinctive spot in the forewing. Females can lay up to 700 eggs, which are placed in clusters of 5-20 on *Buxus* leaves. In Asia they are able to complet 5 generations per year (Leuthardt & Baur 2013) but the average number in Europe is 2-3.



The host: *Buxus* sp.

*Buxus* sp. is an important ornamental plant used in gardens, parks and cemeteries. It is also very common in many natural areas of Europe (Leuthardt & Baur 2013).



Infested ornamental *Buxus* in Besalú.

Fig. 6

## CURRENT DISTRIBUTION IN EUROPE

*C. perspectalis* was first reported in Germany in 2007. The invasión occurs as a consequence of *Buxus* transportation (Wan et al. 2014) and since then it has been detected in some other European countries including France, Italy and Turkey. The first detection in the Iberian Peninsula occurs on September 2013 in Cantabria, and his arrival to Catalonia took place in Besalú on July 2014 (La Garrotxa). The box tree moth has been reported in other towns of Catalonia, such as Figueres (Alt Empordà) or Santa Coloma de Farners (La Selva). It seems likely that in the present day the distribution in Catalonia has increased.

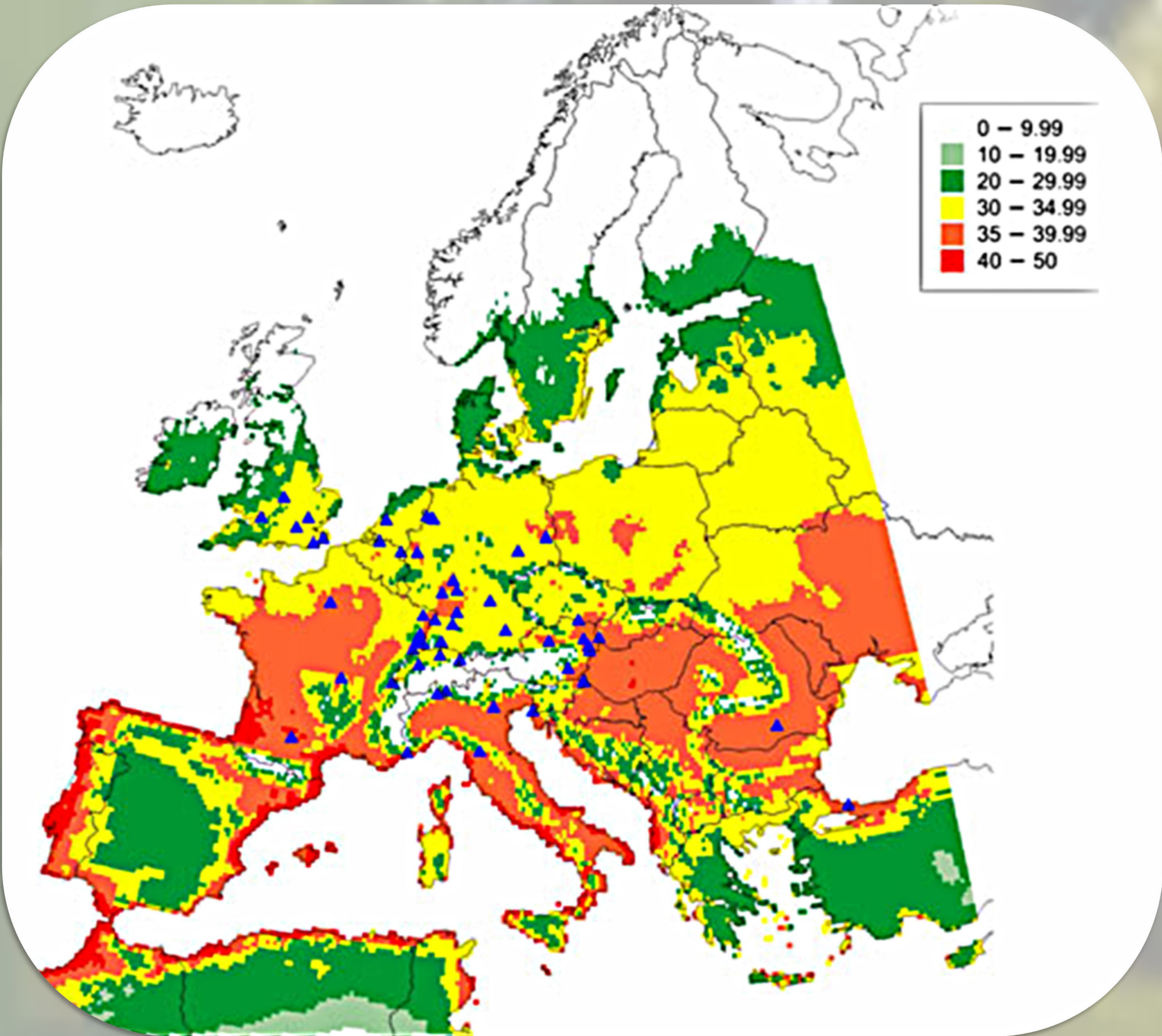


Fig. 7 Map of predicted distribution and relative abundance of *C. perspectalis* in Europe. Triangles represent areas were *C. perspectalis* had been detected in 2012 (Nacambo et al. 2013).

## FUTURE PROSPECTS

The most important factor to define the potential distribution of *C. perspectalis* is temperature. Northern areas are too cold (cold stress threshold determined in -20 °C) and are not expected to be invaded. Areas where summer temperatures reach 40 °C are also not suitable.

The climate in Catalonia is particularly appropriate for the spread of *C. perspectalis*, and the presence of both natural and ornamental box makes the invasion very likely.

## PREVENTIVE MESURES

- Border control and knowledge of the origin of *Buxus*.
- Environmental education and social awareness.
- New technological applications for detection.

## CONTROL AND ERADICATION METHODS

- Physical control: water propulsion, elimination of infected *Buxus*, etc.
- Chemical control: piretroids, fipronil, spinosad, pheromone traps, etc.
- Biological control: not considered in a short term.



Fig. 8

IN CASE OF DETECTION PLEASE CONTACT THE  
“Servei de Sanitat Vegetal”  
(Generalitat de Catalunya)



Fig. 9

## CONCLUSIONS

- Catalonia is a potential territory for the establishment and expansion of *C. perspectalis*.
- Ornamental *Buxus* is expected to suffer the most damage.
- Prevention should be the basis of integrated pest management.
- There is still time to establish protocols to significantly reduce the impact.

## Bibliography

Leuthardt, F. L., & Baur, B. (2013). Oviposition preference and larval development of the invasive moth *Cydalima perspectalis* on five European box-tree varieties. *Journal of Applied Entomology*, 137(6), 437-444.

Nacambo, S., Leuthardt, F. L., Wan, H., Li, H., Haye, T., Baur, B., Weiss RM, & Kenis, M. (2013). Development characteristics of the box-tree moth *Cydalima perspectalis* and its potential distribution in Europe. *Journal of Applied Entomology*, 138(1-2), 14-26.

Wan, H., Haye, T., Kenis, M., Nacambo, S., Xu, H., Zhang, F., & Li, H. (2014). Biology and natural enemies of *Cydalima perspectalis* in Asia: Is there biological control potential in Europe?. *Journal of Applied Entomology*, 138(10), 715-722.

Source of photographs: own elaboration

Acknowledgements: Emili Bassols i Isamat (Parc Natural de la Zona Volcànica de la Garrotxa)